

Remarks/Arguments:

With this Response, claims 1 and 4-7 are amended for clarity and for proper antecedent basis. Claims 11-14 are new. Claims 1-7 and 11-14 are the pending claims.

Claim 5 stands rejected under 35 U.S.C. § 112, first paragraph, as indefinite for failing to provide sufficient antecedent basis for the phrase "said devices" at line 4. The applicants respectfully submit that the claim is clear on its face. "Said devices" refers back to a microelectronic device. The reason "said devices" is plural is because "a group or batch" precedes the phrase. Nonetheless, the applicants have amended the claim for improved clarity. Withdrawal of the rejection is respectfully requested.

Claims 11-14 are newly added. Support for these claims is seen throughout the current specification and original claims. No new matter has been added.

The present invention is directed to a method of determining whether a copper surface has been rinsed free of a cleaning solution containing a corrosion inhibitor. The inventors have found that a residual amount of corrosion inhibitor from the cleaning solution sometimes remains on the surface of the copper even after it is rinsed. To detect whether the cleaning solution was entirely rinsed from the surface of the copper, i.e., to determine the absence of a residual amount of the corrosion inhibitor, a sample copper surface is exposed to a reactant which changes the color of the copper surfaces that are free from, are absent of, or are devoid of, the corrosion inhibitor. In this manner, one can determine whether the cleaning solution was completely rinsed from the surface of the copper. If all of the copper test piece turns a visible color (i.e., it reacts), then the copper batch has been completely rinsed free of residual corrosion inhibitor.

Claims 1-3, 5, and 6 stand rejected under 35 U.S.C. §102(b) as anticipated by Lapluye et al. Lapluye et al. is directed to a corrosion inhibitor and provides test results to demonstrate how the corrosion inhibitor retards the color change of a copper surface treated

with its corrosion inhibitor. Lapluye et al. at col. 15-23 describes an experiment where copper treated with its corrosion inhibitor is compared to copper that has not been treated to demonstrate the effectiveness of the corrosion inhibitor. Particularly, Lapluye et al. reports that copper treated with its corrosion inhibitor changes color only after being exposed to a reactant for 132 minutes, and untreated copper changes color after 2 minutes. In both cases, Lapluye et al. describes that both the treated and the untreated copper changes color.

In contrast, the pending claims are directed to a test method which requires that the reactant only react with the surfaces of the copper that are free from corrosion inhibitor. For example, independent claim 1 requires that the reactant causes a change in the color of the copper surface that is void of residual corrosion inhibitor. Claim 5 requires the reactant to produce a visible color change to a surface of the test piece which lacks corrosion inhibitor. Similarly, claim 11 requires the reactant to react with a copper surface devoid of residual corrosion inhibitor causing a visible color change to that copper surface which is devoid of residual corrosion inhibitor. Accordingly, each independent claim defines a method that is not disclosed by Lapluye et al., namely, that the reactant only reacts with those copper surfaces free of, absent of, or devoid of residual corrosion inhibitor left over from the cleaning solution.

In this manner, it is possible to identify surface areas of the copper that are completely rinsed free of, are absent of, or are devoid of, the corrosion inhibitor and those areas in which a residual amount of the corrosion inhibitor remains on the surface of the copper. The applicants respectfully request that the Examiner reconsider Lapluye et al. as the basis for the §102(b) rejection and withdraw the rejection. Moreover, the pending claims are neither taught nor suggested in Lapluye et al.

Claims 5 and 12 are directed to a process that requires the addition of a sacrificial coupon or test piece when testing a group or batch of microelectronic devices that contain copper surfaces or components. Nowhere in Lapluye et al. do the applicants find a teaching or suggestion of adding a coupon or sacrificial test piece to a group or batch of microelectronic devices to determine whether residual corrosion inhibitor is present on the copper surfaces or components. The applicants respectfully request that the Examiner reconsider Lapluye et al. as the basis for the §102(b) rejection and withdraw the rejection. Moreover, the pending claims are neither taught nor suggested in Lapluye et al.

The secondary reference cited in the Office Action, namely JP59-083913, fails to provide the missing teachings of Lapluye et al. Accordingly, the applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 103(a).

Claims 1 and 4-7 have been amended for improved clarity and claims 11-14 have been added for further clarity. Pending claims 1-7 and 11-14 recite specific method steps that are not taught or suggested by the cited art, either alone or in combination. Indeed, the entire purpose of the claimed method is to test for, and determine, the absence of the corrosion inhibitor after a rinsing step. The applicants respectfully submit that the claims are in a condition for allowance and request early notification to that effect.

Respectfully submitted,



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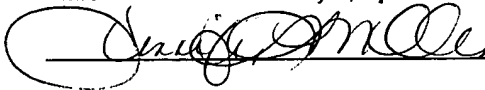
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